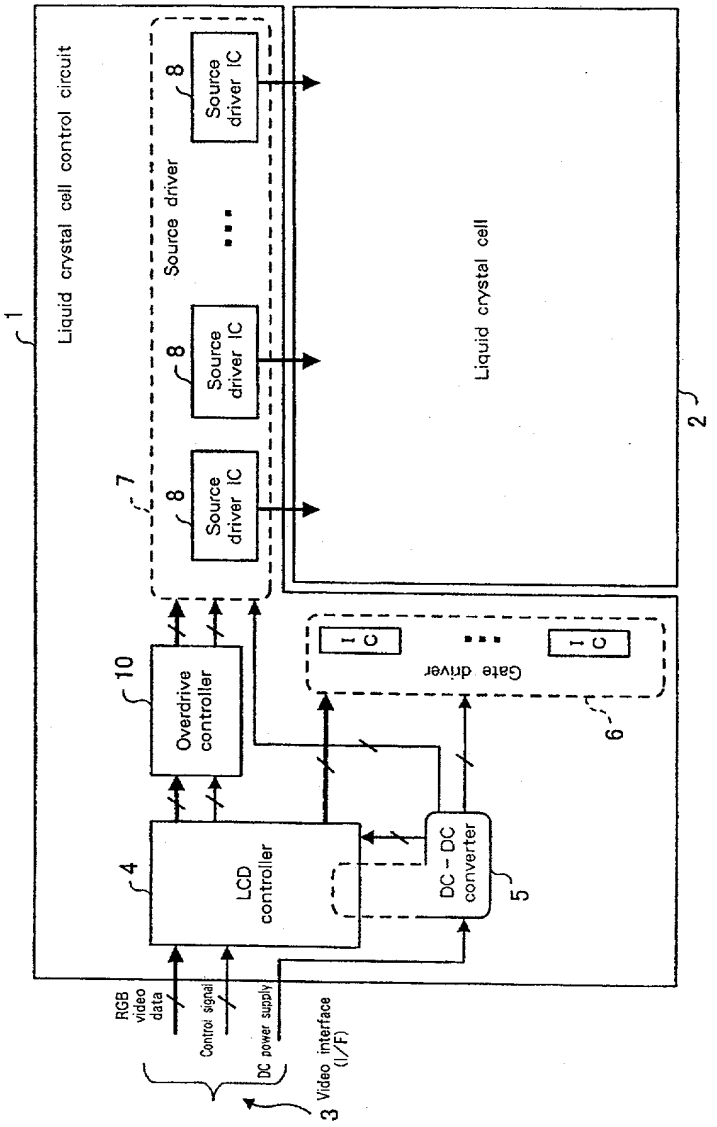
Liquid crystal cell control circuit
1
Source driver
7
Source driver IC
8
Source driver IC
8
Source driver IC
8
Liquid crystal cell
2
Overdrive controller
10
LCD controller
4
DC – DC converter
5
Gate driver
6
I C
I C
RGB video data
Control signal
DC power supply
3 Video interface (I/F)

Fig. 1

APP_ID=10063918

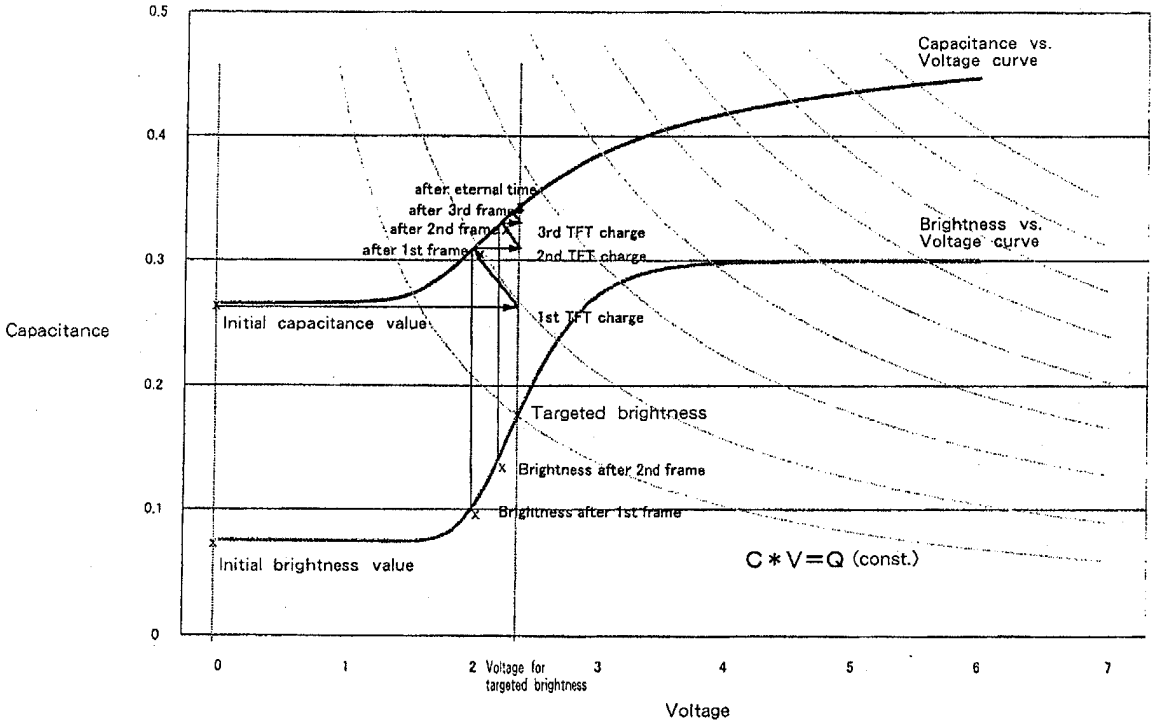

Fig. 2

APP_ID=10063918

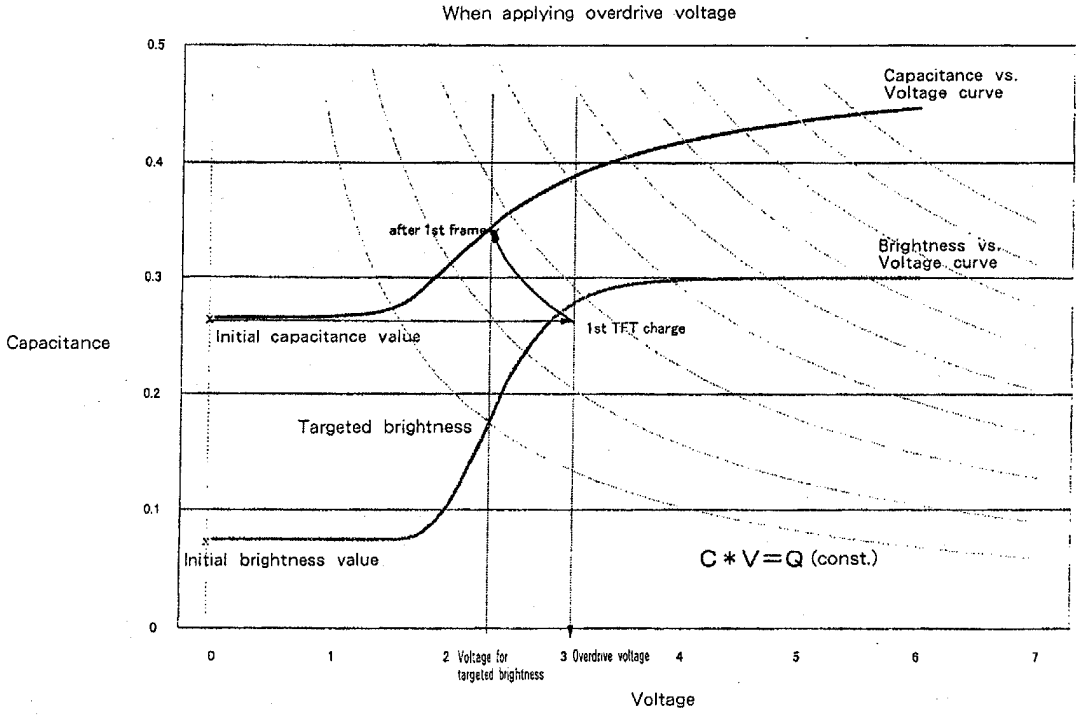

Fig. 3

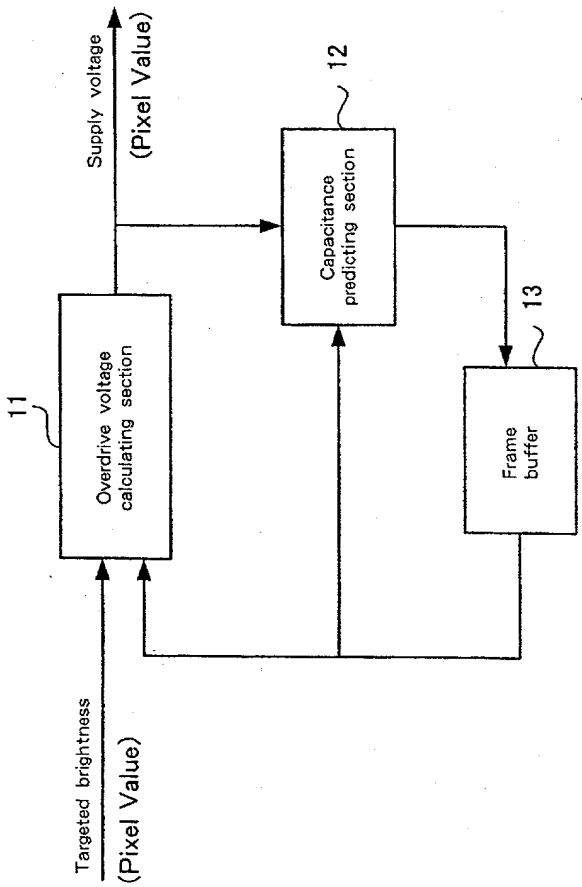
Supply voltage
(Pixel Value)
12
Capacitance predicting section
13
Frame buffer
11
Overdrive voltage calculating section
Targeted brightness
(Pixel Value)

Fig. 4

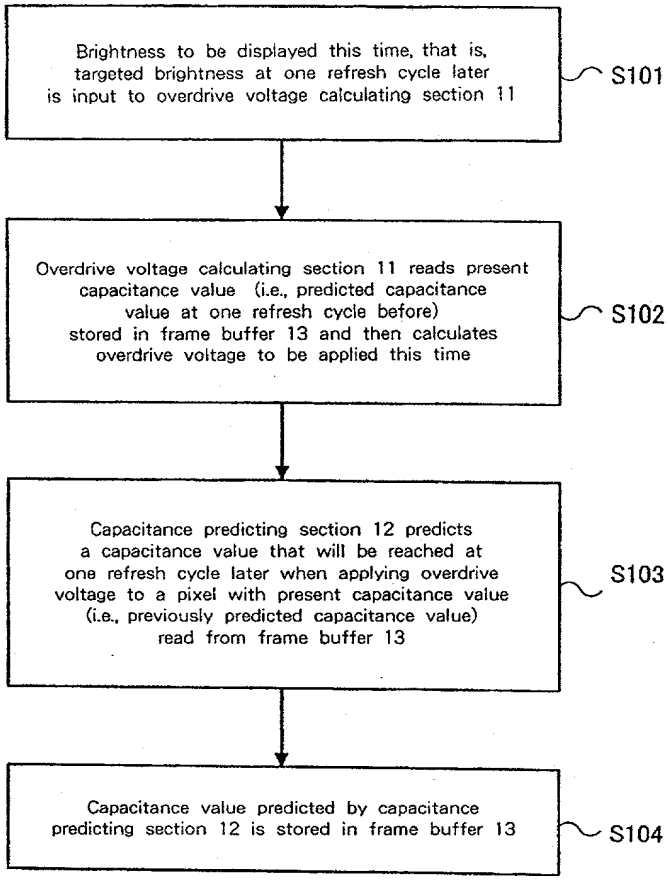
Brightness to be displayed this time, that is, targeted brightness at one refresh cycle later is input to overdrive voltage calculating section 11
S101
Overdrive voltage calculating section 11 reads present capacitance value (i.e., predicted capacitance value at one refresh cycle before) stored in frame buffer 13 and then calculates overdrive voltage to be applied this time
S102
Capacitance predicting section 12 predicts a capacitance value that will be reached at one refresh cycle later when applying overdrive voltage to a pixel with present capacitance value (i.e., previously predicted capacitance value) read from frame buffer 13
S103
Capacitance value predicted by capacitance predicting section 12 is stored in frame buffer 13
S104

Fig. 5

	Target level	level 0	level 1	level 2	level 3	level 4	level 5	level 6	level 7	level 8
Static start level	Targeted brightness \ Starting capacitance	0.00084	0.01030	0.04735	0.11549	0.21812	0.35558	0.53084	0.74584	0.99995
level 8	5.5530	7.9969	6.2088	5.3633	4.7434	4.3583	4.0163	3.7284	3.3490	1
1.2V	5.5836	7.9853	6.1556	5.3011	4.6908	4.3083	3.9580	3.6612	3.2703	1.5190
1.4V	5.6605	7.9546	6.0393	5.1786	4.5808	4.2147	3.8688	3.5410	3.1543	1.1244
1.6V	5.8939	7.8537	5.9457	4.9601	4.4310	4.0057	3.6906	3.3380	2.9389	1.0166
2.0V	7.2035	6.9652	5.3997	4.3980	3.8826	3.4630	3.1309	2.7736	2.3330	0
level 7	7.8413	6.7616	4.9793	4.1777	3.6770	3.2898	2.9263	2.5856	2.168	0
level 6	8.5975	6.3884	4.7512	3.9271	3.4393	3.0598	2.7401	2.385	1.9596	0
level 5	9.1804	5.9943	4.4998	3.7848	3.3111	2.9200	2.579	2.2487	1.7995	0
level 4	9.6941	5.9067	4.3949	3.6299	3.1811	2.782	2.4674	2.1403	1.6869	0
level 3	10.1912	5.7948	4.2666	3.4791	3.023	2.7102	2.3720	2.0355	1.5911	0
level 2	10.7078	5.6447	4.0978	3.346	2.9358	2.5869	2.2742	1.9221	1.4946	0
level 1	11.3424	5.4002	3.907	3.2696	2.8290	2.4518	2.1494	1.7938	1.3155	0
level 0	12.1062	5	3.8051	3.0822	2.6795	2.3293	1.9869	1.6461	1.1323	0

Fig. 6

APP_ID=10063918

Applied voltage / Starting capacitance	0	1	2	2.5	3	4	5	6	7	8
5.52	5.52	5.54	5.66	5.96	6.74	9.23	10.62	11.33	11.78	12.11
5.55	5.53	5.55	5.74	6.14	7.05	9.39	10.66	11.34	11.79	12.12
6.45	5.70	5.85	6.72	7.62	8.60	10.12	11.02	11.59	11.99	12.30
7.84	5.93	6.24	7.53	8.48	9.36	10.62	11.38	11.88	12.25	12.53
8.60	6.05	6.42	7.86	8.81	9.65	10.83	11.54	12.02	12.37	12.64
9.69	6.22	6.69	8.29	9.23	10.02	11.09	11.75	12.19	12.52	12.78
10.71	6.38	6.94	8.65	9.56	10.30	11.30	11.91	12.33	12.65	12.89
11.74	6.59	7.22	8.98	9.85	10.55	11.48	12.06	12.46	12.76	12.99
12.11	6.67	7.33	9.09	9.94	10.62	11.54	12.11	12.50	12.80	13.02
13.54	7.04	7.74	9.45	10.25	10.88	11.73	12.26	12.64	12.91	13.13

Fig. 7